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Predictors of oral health-related quality of life in Iranian adolescents: A prospective study

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Abstract

Aim: In the present study, we evaluated the direct and mediating (indirect) effects of clinical oral conditions, dental anxiety, sense of coherence (SOC), and socioeconomic variables on oral health-related quality of life (OHRQoL) and general health-related quality of life (GHRQoL) in Iranian adolescents.

Methods: A longitudinal design was used with a sample of 1052 (694 males, mean age=15.05 years) schoolchildren from Qazvin, Iran. Each participant completed a background information sheet and the following scales at baseline: Modified Dental Anxiety Scale, SOC, PedsQL 4.0 Generic Core Scale, and PedsQL Oral Health Scale. The PedsQL 4.0 Generic Core and Oral Health scales were recompleted at the 18-mo follow up.

Results: Father's education, monthly family income, dental anxiety, Community Periodontal Index (CPI), decayed, missing, and filled teeth (DMFT), and SOC significantly and directly predicted OHRQoL at 18 mo. Father's education had indirect effects on OHRQoL through CPI and DMFT, family income had indirect effects through DMFT, and dental anxiety had indirect effects through CPI. OHRQoL at 18 mo (β=0.499) and SOC (β=0.084) had significant and direct and mediating effects through OHRQoL on GHRQoL, while father's education, monthly family income, dental anxiety, CPI, and DMFT only showed mediating effects.

Conclusions: Clinical oral indicators had direct effects on OHRQoL, but mediated the effects of dental anxiety and socioeconomic status on both OHRQoL and GHRQoL.

KEYWORDS

adolescent, longitudinal study, oral health, oral health-related quality of life, structural equation modeling

1 | INTRODUCTION

There is now a paradigm shift from the traditional biomedical model of health to biopsychosocial model of health that emphasizes an individual's social, emotional, as well as physical functioning.[1] Although clinical indices are useful for measuring oral disease levels, they are not suitable for gauging health and treatment needs.[2] This limitation with clinical measures paved the way to the development of measures of oral health-related quality of life (OHRQoL), which takes into account the multidimensional nature of health.[3] Previously, OHRQoL was only used when examining adult patients; however, the impacts of oral disorders on quality of life (QoL) have also been found in children and adolescents more recently. Moreover, the impacts on children could be as great as or greater than those on adults.[4] Oral disorders can also impact general health by causing pain and affecting functional ability when performing daily life activities.[5] However, contemporary research on OHRQoL in children substantially relies on OHRQoL instruments only specific to oral health. General health-related quality

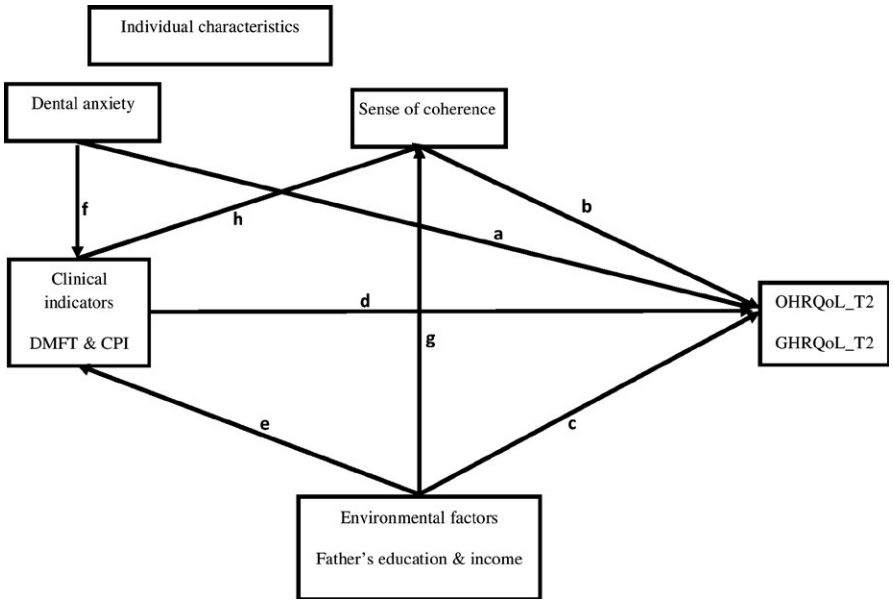

FIGURE 1 Conceptualized effect of clinical, individual, and environmental factors on prospective oral health-related quality of life (OHRQoL) and general health-related quality of life (GHRQoL) based on the Wilson and Cleary model. CPI, Community Periodontal Index; DMFT, decayed, missing, and filled teeth; T2, 18-mo follow up

of life (GHRQoL) instruments do not account for the specific impact of oral health on overall well-being, despite oral diseases being among the most prevalent conditions among children.[6] Therefore, the use of both generic and disease-specific instruments has been suggested in order to understand the impact of oral health on general well-being and to measure the direct impact of physical impairment or functional limitation caused by oral diseases.[7]

general health-related quality of life, as defined by the World Health Organization (WHO), is a subjective perception of life quality that is affected by physical health and psychological state, and also personal beliefs and social relationships.[6] OHRQoL refers to an individual's view of functioning, social interaction, and psychological well-being with respect to oral health.[7] In simpler terms, GHRQoL and OHRQoL are an individual's perception of QoL with regard to overall health and specific to oral health, respectively.

However, the concept of HRQoL is complex and dynamic.[8] There are several factors, ranging from the biologic to individual and environmental characteristics, and their complex interactions, that influence HRQoL.[9] For example, OHRQoL in children is influenced by clinical oral health status, dental anxiety, and socioeconomic status.[10-12] Likewise, GHRQoL is influenced by several non-medical and social factors.[13,14] Sense of coherence (SOC) is one of those factors that strongly predict QoL. Individuals with a strong SOC do not consider life situations to be stressful, and use available resources to cope with stress.[15-17] Studies that have tested the effect of several psychosocial variables on QoL have indicated SOC as the only persistent psychosocial variable in predicting QoL.[16,18]

Understating the relationships between various predictors is important, as this knowledge would be helpful in designing effective interventions that can improve QoL. A thorough knowledge of these interactions and processes would help in planning targeted oral-promotion strategies, particularly with respect to subjective oral health outcomes.[16,19] This prospective study aimed to evaluate the direct and mediating effects of clinical oral conditions, dental anxiety, SOC, and socioeconomic variables on OHRQoL and GHRQoL in Iranian adolescents.

We conceptualized a model based on the Wilson and Cleary model of the impacts of the clinical, individual, and environmental variables on OHRQoL and HRQoL, as depicted in Figure 1:[9]

(a) direct effects: dental anxiety on OHRQoL at follow up, SOC, environmental characteristics, and clinical indicators would have a direct effect on OHRQoL and GHRQol at follow up;
(b) mediating effects: effects of environmental factors on OHRQoL and GHRQoL would be mediated through clinical indicators, and effect of dental anxiety on OHRQoL would be mediated through clinical variables, SOC would have a mediating effect on the association of socio-economic factors, and clinical indicators with OHRQoL and GHRQol;
(c) OHRQoL will have a direct effect on GHRQol, as conceptualized by Sicho and Broder.[1]

2 | MATERIALS AND METHODS

This longitudinal study was conducted in Qazvin (located 150 km northwest of Tehran), Iran, between May 2013 and May 2015. Ethical approval for the study was granted by the Qazvin University of Medical Sciences. Permission to conduct the study was obtained from the Organization for Education at Qazvin, respective schools, and parents of adolescents, as well as the adolescents themselves.

2.1 | Participants

A two-stage sampling technique was employed to select the adolescents. Qazvin has two different educational districts containing 52 secondary schools. At the first step, four secondary schools were randomly selected in each district from an official list of public secondary

schools provided by the Qazvin education area. At the second step, all the adolescents were included in the study. However, students who used a fixed orthodontic appliance were excluded.

2.2 | Measures

2.2.1 | Sociodemographic information

Sociodemographic information of the adolescents, including age, sex, father's and mother's years of education, and number of family members, were collected from student records. A self-administered questionnaire was used to ask the adolescents to indicate the frequency of tooth brushing (1=never, 2=less than once per month, 3=less than once per week, 4=once per week, 5=once per day, and 6=twice per day) and dental flossing (1=never, 2=less than once per month, 3=less than once per week, 4=once per week,and 5=once per day), as well as time interval since the last dental visit (1=never, 2=more than 2 years, 3=last 1-2 years, 4=last 6-12 mo, and 5=less than 6 mo ago).

2.2.2 | Dental anxiety

The level of dental anxiety was assessed using the Modified Dental Anxiety Scale (MDAS)[20] The MDAS has five items, which are rated on a five-point Likert-type scale ranging from one (not anxious) to five (extremely anxious), with higher scores indicating higher dental anxiety. All item scores are summed to produce a total score for the MDAS. The MDAS has been translated into several languages, including Persian. The Persian version of the MDAS was found to highly valid, reliable, simple, quick, and easy to complete for using in Iranian populations.[21]

2.2.3 | Sense of coherence

Sense of coherence was measured using Antonovsky's SOC scale.[22] The SOC has 13 items, which are rated on a seven-point Likert scale ranging from "never" (1) to "always" (7). The total SOC score is the sum of all items, with the possible responses ranging from 7 to 91, and higher scores indicating stronger SOC. The SOC-13 has been used in several languages, including Persian, and its scores were valid and reliable among Iranian adolescents (Cronbach's α=0.87 and test-retest reliability=0.77).[23]

2.2.4 | General health-related quality of life

The PedsQL 4.0 Generic Core scales were used to assess GHRQoL. The PedsQL 4.0 Generic Core scales are self-administered questionnaires that have two parallel versions, including child self-reports and parent proxy reports. This measure has 23 items that cover four dimensions, including physical functioning (8 items), emotional functioning (5 items), social functioning (5 items), and school functioning (5 items). All items are rated on a five-point Likert scale ranging from "never a problem" (score=0) to "almost always a problem" (score=4). The item responses are reversed and then transformed into a zero-to-100 point scale, with higher scores indicating better HRQoL. The psychometric properties of the Persian version of the PedsQL 4.0 Generic Core scales have been reported elsewhere.[24]

2.2.5 | Oral health-related quality of life

Oral health-related quality of life was measured using the five-item PedsQL Oral Health Scale. All items are rated on a five-point Likert scale ranging from "never a problem" (score=0) to "almost always a problem" (score=4). Identical to the PedsQL 4.0 Generic Core scales, all items of the PedsQL Oral Health Scale are reversed and then transformed into a zero-to-100 point scale, with higher scores indicating better OHRQoL. The Persian version of the PedsQL Oral Health Scale was translated, and its scores were validated by Pakpour et al., who tested the psychometric properties among Iranian children and adolescents.[25]

2.2.6 | Clinical oral examination

All adolescents were clinically examined by two trained and calibrated dentists in a classroom under natural light during daytime hours. The decayed, missing, and filled teeth (DMFT) index and Community Periodontal Index (CPI) were measured according to the recommendations of the WHO for epidemiological surveys.[26] To improve the reliability of the study, the dentists were trained and calibrated by an experienced examiner at Faculty of Dentistry of Qazvin University of Medical Sciences, Qazvin, Iran, 2 weeks before commencement of the study. An independent sample of 16 adolescents was examined by the dentists. These dentists independently re-examined the adolescents after 24 h of the first examination. The results of the kappa coefficients revealed that interexaminer reproducibility was 0.97 and 0.94 for the mean DMFT and the mean CPI score, respectively. In addition to this, intra-examiner reproducibility was also assessed, and the results indicated that the Kappa coefficients were 0.96 and 0.95 for the mean DMFT and the mean CPI score, respectively.

2.3 | Procedure

All adolescents were asked to complete the questionnaire, including oral health behaviors, MDAS, SOC-13, the PedsQL 4.0 Generic Core scales and PedsQL Oral Health Scale, in a classroom setting. Afterward, the dentists clinically examined the adolescents in classrooms under natural daylight using standard explorers, mirrors, and CPI probes. Eighteen months later, the same adolescents were asked to recomplete the PedsQL 4.0 Generic Core scales and the PedsQL Oral Health Scale.

2.4 | Statistical analysis

Before we tested the proposed model, we first examined the construct validity of two QoL instruments (PedsQL 4.0 Generic Core scales for GHRQoL and the PedsQL TM Oral Health Scale for OHRQoL) using

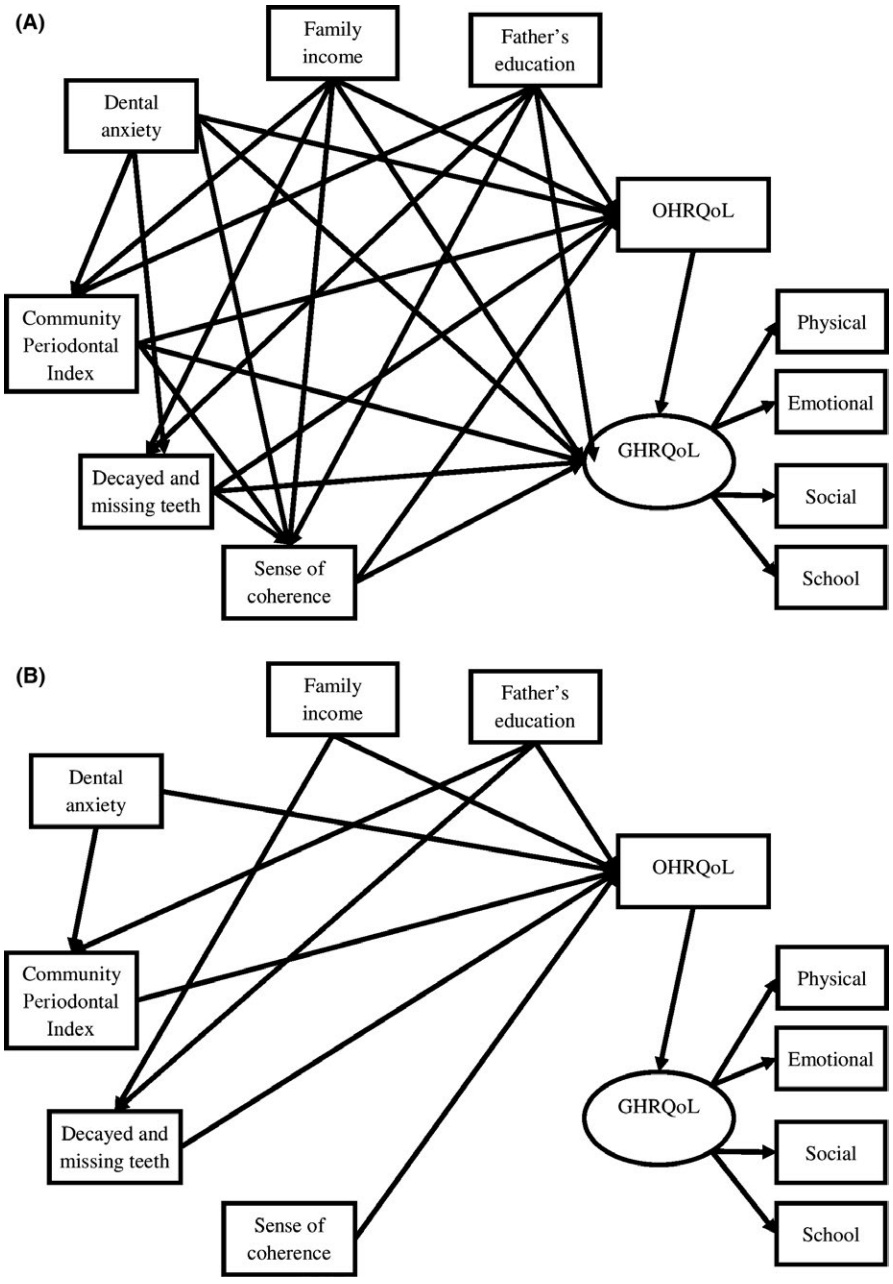

FIGURE 2 (A) Proposed model; (B) final model. OHRQoL and GHRQoL were assessed at 18-mo follow up; all other variables were assessed at baseline. GHRQoL, general health-related quality of life; OHRQoL, oral health-related quality of life

confirmatory factor analysis (CFA). We then used structural equation modeling (SEM) to answer our research questions. The proposed model examined the impacts of several potential predictors (father's education; monthly family income; dental anxiety; CPI; DMFT; SOC) on both 18-mo follow ups for OHRQoL and GHRQoL (Figure 2A). The potential predictors did not include mother's education because mother's education was highly correlated with father's education (r=.8). We also analyzed the indirect impacts of these predictors on generic quality of life at 18-mo follow-up through OHRQoL. In addition, some mediating effects for OHRQoL were investigated using the proposed model.

For both CFA and SEM, we used the following fit indices to evaluate the data-model fit: χ^2-test, comparative fit index (CFI), Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). The cut-offs for satisfactory fit were set at CFI and TLI >0.9, and RMSEA and SRMR <0.08.[27] Although an insignificant χ^2-test also suggests a good data-model fit, we intended not to use the criterion because of its oversensitivity to a large sample,[28,29] In addition, the direct and indirect effects were tested using bootstrap methods. Specifically, we used the bias-corrected bootstrap with 1000 bootstrap samples to calculate the 95% confidence intervals (CI), and the indirect effects occur when the confidence interval does not contain zero.[30,31]

Some respondents did not fully answer the following scales: PedsQL oral-related health module at base (missing, n=33) and at 18-mo follow up (missing, n=20): PedsQL generic scale at 18-mo follow-up (missing, n=197), modified dental anxiety scale (missing, n=1), CPI (missing, n=3), DMFT (missing, n=42), and SOC (missing, n=34). In

order to reach the maximum power in SEM, we used Bayesian imputation to impute the missing values mentioned earlier.[32,33] The descriptive analyses were done using SPSS 17.0 (SPSS, Chicago, IL, USA), and SEM were performed using AMOS 20.0 (IBM SPSS, USA).

3 | RESULTS

A total of 1529 students participated in the present study, with a response rate of 90%. Sixty-four (4.2%) adolescents were lost to follow up. The participants' demographics, health behaviors on dental care, and health outcomes are shown in Table 1. The mean age of the participants was 15.05 (standard deviation [SD]=2.12) years, and slightly less than half of them were male (45.4%). In terms of their health behaviors, more than one-third of the participants (34.1%) had never been to a dentist, and only one-fifth (20.8%) had visited a dentist within 6 mo. In addition, more than one-tenth (12.4%) brushed their teeth less than once per month, and nearly half (46.2%) of them never used dental floss. For the health outcomes, the mean±SD scores were 14.65±5.44 for MDAS, 6.83±2.75 for oral health knowledge, 1.62±1.11 for CPI, 2.19±2.32 for DMFT, 28.79±13.83 for SOC, 65.87±18.65 for overall GHRQoL at baseline and 77.72±13.20 at 18-mo follow up, and 74.99±26.37 for OHRQoL at baseline and 80.70±18.43 at 18-mo follow up.

Our data fit perfectly in the CFA and SEM, except for the significant χ^2-tests, as shown in Table 2. We additionally examined the effects of all predictors on adolescents' OHRQoL, and found that all predictors were significant (Table 3). Higher scores of dental anxiety, CPI, and DMFT predicted a worse OHRQoL at 18-mo follow up. In contrast, higher level of father's education, monthly family income, SOC, and baseline OHRQoL predicted a better OHRQoL at 18-mo follow up. Moreover, we found that OHRQoL had a strong direct effect on GHRQoL (β=0.499; 95% CI=0.460-0.539). Based on the direct effect of OHRQoL on GHRQoL, it is clear that all the predictors had indirect effects on GHRQoL through OHRQoL; however, all the predictors, with the exception of SOC (β=0.084; 95% CI=0.035-0.123), did not have direct effects on GHRQoL, as we hypothesized (Figure 2B).

As hypothesized, our results showed that father's education and monthly family income had indirect effects on OHRQoL and GHRQoL. Dental anxiety also had an indirect effect on OHRQoL mediated by CPI and/or DMFT (Table 3). However, SOC did not exert any mediating effect on the influence of father's education and income on OHRQol or GHRQoL (Figure 2B).

4 | DISCUSSION

In this longitudinal study, we evaluated the influence of clinical oral conditions, dental anxiety, SOC, and socioeconomic variables on OHRQoL and GHRQoL in Iranian adolescents. We also assessed the direct and theoretically-driven mediating effects of these variables on OHRQoL and GHRQoL. Longitudinal studies in this area are scarce, and to the best of our knowledge, there is only one study evaluating

TABLE 1 Participants characteristics

	n (%) or mean±SD
Demographics	
Age	15.05±2.12
Sex (male)	694 (45.4%)
No. family members	
≤5	903 (59.6%)
6-10	546 (35.7%)
>10	65 (3.9%)
Father's years of education	8.35±5.38
Mother's years of education	6.39±5.33
Teeth and gum care	
Last time visited dentist	
<6 mo	318 (20.8%)
6 mo-1 y	226 (14.8%)
1-2 y	128 (8.4%)
>2 y	256 (16.7%)
Never	521 (34.1%)
Frequency of using dental brush	
Never	111 (7.3%)
Less than once per month	78 (5.1%)
Less than once per week	82 (5.4%)
Once per week	216 (14.1%)
Once per day	717 (46.9%)
Twice per day	321 (21.0%)
Frequency of using dental floss	
Never	706 (46.2%)
Less than once per month	169 (11.1%)
Less than once per week	163 (10.7%)
Once per week	225 (14.7%)
Once per day	245 (16.0%)
Health outcomes	
Modified Dental Anxiety Scale	14.65±5.44
Community Periodontal Index	1.62±1.11
Decayed and missing teeth	2.19±2.32
Sense of coherence	28.79±13.83
GHRQoL at baseline	65.87±18.65
Physical functioning	74.50±25.45
Emotional functioning	71.13±24.41
Social functioning	51.53±16.05
School functioning	60.37±22.66
GHRQoL at 18 mo	77.72±13.20
Physical functioning	81.00±16.10
Emotional functioning	72.27±18.70
Social functioning	75.71±14.63
School functioning	79.38±17.33
OHRQoL at baseline	74.99±26.37
OHRQoL at 18 mo	80.70±18.43

GHRQoL, general health-related quality of life; OHRQoL, oral health-related quality of life; SD, standard deviation.

TABLE 2 Fit indices for confirmatory factor analysis and SEM

Model	χ^2 (*df*)	CFI	TLI	RMSEA	SRMR
CFA for GHRQoL	1783.252 (213)*	0.920	0.905	0.069	0.057
CFA for OHRQoL	10.219 (3)*	0.998	0.995	0.040	0.007
Structural equation modelling	179.212 (41)*	0.971	0.954	0.047	0.025

CFA, confirmatory factor analysis; CFI, comparative fit index; GHRQoL, general health-related quality of life; OHRQoL, oral health-related quality of life; RMSEA, root mean square error of approximation; SRMR, standardized root mean square residual; TLI, Tucker-Lewis Index.
*P<.001.

TABLE 3 Predictors for OHRQoL and GHRQoL at 18-mo follow up

Predictors	β	Bootstrap SE	Bias-corrected 95% CI (lower bound)	Bias-corrected 95% CI (upper bound)
Direct effects on GHRQoL				
OHRQoL at 18 mo	0.499*	0.020	0.460	0.539
Father's education	0.001	0.025	−0.048	0.054
Monthly family income	0.039	0.021	−0.005	0.081
Community Periodontal Index	0.030	0.023	−0.019	0.072
Decayed and missing teeth	−0.034	0.019	−0.068	0.007
Sense of coherence	0.084*	0.021	0.035	0.123
Indirect effects on GHRQoL mediated by OHRQoL=direct effects of OHRQoL				
Father's education	0.235*	0.023	0.184	0.278
Monthly family income	0.163*	0.023	0.119	0.209
Dental anxiety	−0.142*	0.023	−0.185	−0.094
Community Periodontal Index	−0.118*	0.023	−0.163	−0.075
Decayed and missing teeth	−0.171*	0.027	−0.225	−0.120
Sense of coherence	0.110*	0.021	0.069	0.153
Indirect effects on OHRQoL/GHRQoL mediated by decayed and missing teeth				
Father's education	0.073*	0.025	0.021	0.122
Monthly family income	−0.077*	0.024	−0.124	−0.032
Dental anxiety	0.008	0.025	−0.045	0.057
Indirect effects on OHRQoL/GHRQoL mediated by Community Periodontal Index				
Father's education	0.064*	0.026	0.013	0.115
Monthly family income	−0.022	0.024	−0.071	0.022
Dental anxiety	0.090*	0.024	0.042	0.141
Indirect effects on OHRQoL/GHRQoL mediated by sense of coherence				
Father's education	−0.010	0.026	−0.066	0.039
Monthly family income	0.046	0.027	−0.008	0.101
Decayed and missing teeth	0.022	0.022	−0.021	0.066
Community Periodontal Index	0.001	0.027	−0.049	0.058

CI, confidence interval; GHRQoL, general health-related quality of life; OHRQoL, oral health-related quality of life; SE, standard error.
*P<.05.

the effects of various predictors on OHRQoL in adolescents with a longitudinal design.[18] Further, SEM was used in the present study, which helps in the concurrent assessment of the direct and indirect effects of exploratory variables on the outcome; this is not possible with traditional regression analysis.[34] Presently, there are many validated instruments available to evaluate the OHRQoL in children and

adolescents, but we prefer the PedsQL Oral Health Scale, as many of the existing measures are specific and fail to evaluate the impact of oral health on general health domains.[25,35] The PedsQL Oral Health Scale was introduced to measure OHRQoL as a component of GHRQoL.[6,35,36] This measure has already been translated into Persian and was found to be valid and reliable in assessing OHRQoL among Iranian children.[25]

In addition to socioeconomic variables, we also assessed the effects of dental anxiety and SOC on QoL in the present study. Research indicates that OHRQoL is significantly related to SOC,[19,37,38] and also dental anxiety.[39,40] We found that SOC and dental anxiety were significantly related to self-perceived oral health, with dental anxiety having a negative impact, and SOC having a positive impact. SOC was also associated with GHRQoL, which is indisputably consistent in the literature.[41-43] According to salutogenic theory, a strong SOC is associated with physical and psychological health.[44] Individuals with high SOC tend to be more resilient in stressful situations, and thus less distressed.[45] Individuals who are anxious tend to avoid dental visits and rely on self-care, and thus have poor clinical oral health status, which affects their QoL.[40] In accordance with the literature, OHRQoL increased in line with parental education level and family income.[12,14] This might be because lower education level and income lead to material deprivation, which results in limited access to health facilities, and thus poor QoL.[12] However, it was surprising and beyond our understanding that the socioeconomic variables failed to directly influence GHRQoL, but had mediating effects via OHRQoL.

We also found that clinical status (dental caries and periodontal status) predicted OHRQoL. There are conflicting reports on the effect of clinical status on OHRQoL.[37] However, a systematic review by Barbosa and Gaviao concluded that clinical oral status is related to OHRQoL.[10] They suggested that weak relationships observed between clinical status and OHRQoL in a few studies might be due to low disease levels or low impact of the condition under investigation in those studies.[10] As with socioeconomic variables, oral indicators did not have a direct effect on GHRQoL. This might be because of the clinical indicators used in the present study. In order to have an impact on general well-being (or GHRQoL), the oral condition has to be associated with considerable pain and limited functioning, which is possible when dental caries involves pulpal involvement, and very few adolescents in our study had dental caries associated with pupil involvement. This is in accordance with a previous study on adolescents.[46] The periodontal status of the study population was considerably fair (CPI: 1.62±1.11), with gingival bleeding and calculus being observed in a majority of the population, which have direct relevance to OHRQoL rather than GHRQoL. A literature review found that four of the seven reviewed studies demonstrated an association between oral health status and GHRQoL, but the only study that had evaluated the effect of dental caries on GHRQoL demonstrated results similar to ours.[47]

Quality of life is a subjective perception that differs between cultures, and is determined by population preferences for a given health state.[48] Therefore, the findings of the present study might not be generalizable to those conducted in other cultures. However, as the sample selected was representative of the Qazvin province, the findings can be generalized to the child population of Qazvin, and Iran as a whole. Although we have tried to include the factors which we assumed to be predictors of QoL in the present study, we could have missed some potential predictors that might be significantly related to QoL. As envisaged by Wilson and Cleary, overall QoL is associated with several factors at various levels, ranging from individual perceptions and psychosocial factors to environmental and traditional clinical variables.[9] Further, there are several other factors that might operate at each level that are integrated and difficult to define.[9] Another limitation that should be mentioned is the clinical indices used in the present study and low level of disease burden observed. The effect of clinical indicators on perceived QoL would have been different if the disease burden was more or was associated with considerable pain. In addition, the SEM analysis, without using weighted structure, is the third limitation. Because we used the two-stage sampling method, a cluster effect is very likely to exist and could result in sampling errors. Therefore, decreased statistical power could have occurred. Some would suggest using weighted structure to resolve this. However, we did not do so because we wanted to fulfill the principle of parsimony in the SEM. In addition, we did not collect any cluster-level information (e.g the overall social economic status in each school). Moreover, we are confident that our sample size was quite large, and the problem of decreased statistical power can somewhat be remediated. Nevertheless, future researchers might want to use a weighted structure in the SEM when they adopt a two-stage sampling method, especially those with small sample sizes.

Few studies have indicated that disease status is associated with SOC,[49] but we observed no mediating effect of SOC on the association of clinical oral status with QoL. Supporting our finding, a literature review found psychological status but not physical health status to be associated with SOC.[50] Literature also suggests the existence of a psychosocial pathway, with individuals belonging to higher social status having optimum conditions for the development of SOC.[49] A few studies have also observed that higher socioeconomic status during childhood is predictive of better SOC in adulthood.[51] Therefore, we assumed that SOC might mediate the effect of socioeconomic status on QoL. However, socioeconomic status had a direct effect but not a mediating effect via SOC on QoL. SOC might play an important role in mediating the effect of the socioeconomic status on QoL perception in patients with chronic and severe diseases, as individuals with higher socioeconomic statuses have greater resources to cope with the stress than those with lower socioeconomic statuses. However, this explanation might not be sufficient when the disease burden is low and less severe, as was observed in our study.

5 | CONCLUSIONS

As hypothesized, clinical oral indicators and socioeconomic variables had a direct effect on OHRQoL, while it was surprising to observe that SOC was the only factor to directly influence GHRQoL. Given the relevance of SOC to both OHRQoL and GHRQoL, planning salutogenic

interventions for this study population might help in improving QoL. Although oral health did not have a direct effect on GHRQoL, the observed direct effect of OHRQoL on GHRQoL demonstrates that the perception of oral health well-being has an effect on general well-being. The observation of clinical oral conditions mediating the effect of dental anxiety and socioeconomic variables on OHRQoL and GHRQoL emphasizes the importance of improving clinical oral status to improve the overall perception of QoL. Both the SOC and socioeconomic variables had an effect on the subjective perception of well-being. The multiple direct and mediated effects that were observed provide more opportunities in planning targeted oral health promotion strategies for improving QoL in this population.

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